Electronic TUBES

10C8

TRIODE-PENTODE

DESCRIPTION AND RATING

The 10C8 is a miniature triode-pentode designed for use in compact, 300-milliampere, series-string television receivers. The pentode section may be used as a general-purpose amplifier or as a triode-connected vertical-deflection amplifier. The high-mu triode section is suitable for use as a vertical oscillator, AF voltage amplifier, or as a sync separator, clipper, or amplifier.

The 10C8 has a controlled heater warm-up characteristic as required for use in television receivers that employ series-connected heaters. Other features of the tube include relatively small size, low power requirements, and high performance capabilities at the low d-c supply voltages normally available in these applications.

GENERAL

ELECTRICAL

Cathode—Coated Unipotential

Heater Voltage, AC or DC	10.5	Volts
Heater Current	0.3±6%	Amperes
Heater Warm-up Time*	11	Seconds
Direct Interelectrode Capacitances†		
Pentode Section		
Grid-Number 1 to Plate, maximum	0.04	μμf
Input	7.0	μμf
Output	2.2	μμf
Triode Section		
Grid to Plate	1.6	μμf
Input	2.4	μμf
Output	0.20	μμf
Pentode Grid-Number 1 to Triode Plate, maximum	0.008	μμf
Triode Grid to Pentode Plate, maximum	0.006	μμf
Pentode Plate to Triode Plate, maximum	0.06	μμf

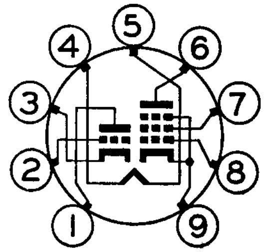
MECHANICAL

Mounting Position—Any

Envelope—T-6½, Glass

Base—E9-1, Small Button 9-Pin

BASING DIAGRAM

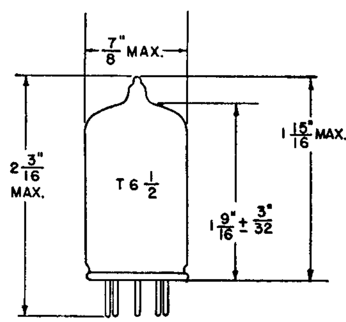


RETMA 9DA

TERMINAL CONNECTIONS

Pin 1—Triode Plate
Pin 2—Triode Grid
Pin 3—Triode Cathode
Pin 4—Heater
Pin 5—Heater
Pin 6—Pentode Plate
Pin 7—Pentode Grid Number 2 (Screen)
Pin 8—Pentode Grid Number 1
Pin 9—Pentode Cathode, Grid Number 3, and Internal Shield

PHYSICAL DIMENSIONS



RETMA 6–2

GENERAL ELECTRIC

MAXIMUM RATINGS

CLASS A_1 AMPLIFIER SERVICE—DESIGN-MAXIMUM VALUES	Pentode Section	Triode Section	
Plate Voltage	300	300	Volts
Screen-Supply Voltage	300	....	Volts
Screen Voltage—See Screen Rating Chart			
Positive DC Grid-Number 1 Voltage	0	0	Volts
Plate Dissipation	2.2	2.0	Watts
Screen Dissipation	0.55	....	Watts
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode			
DC Component	100	100	Volts
Total DC and Peak	200	200	Volts
Heater Negative with Respect to Cathode			
Total DC and Peak	200	200	Volts
Grid-Number 1 Circuit Resistance			
With Fixed Bias	0.25	0.5	Megohms
With Cathode Bias	1.0	1.0	Megohms

VERTICAL OSCILLATOR AND AMPLIFIER SERVICE DESIGN-MAXIMUM VALUES	Vertical-deflection Amplifier‡ (Pentode Section-triode Connection§)	Vertical Oscillator Service‡ (Triode Section)	
DC Plate Voltage	300	300	Volts
Peak Positive Pulse Plate Voltage	1000	....	Volts
Peak Negative Grid Voltage	250	400	Volts
Plate Dissipation	2.5♦	1.0	Watts
DC Cathode Current	18	12	Milliamperes
Peak Cathode Current	55	35	Milliamperes
Heater-Cathode Voltage			
Heater Positive with Respect to Cathode			
DC Component	100	100	Volts
Total DC and Peak	200	200	Volts
Heater Negative with Respect to Cathode			
Total DC and Peak	200	200	Volts
Grid Circuit Resistance			
With Fixed Bias	...	2.2	Megohms
With Cathode Bias	2.2	2.2	Megohms
With Grid-Leak Bias	2.2	2.2	Megohms

Design-Maximum Ratings are the limiting values expressed with respect to bogie tubes at which satisfactory tube life can be expected to occur for the types of service for which the tube is rated. Therefore, the equipment designer must establish the circuit design so that initially and throughout equipment life no design-maximum value is exceeded with a bogie tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, and environmental conditions.

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

	Pentode Section (Triode-Connection§)	Pentode Section	Triode Section	
Plate Voltage	135	135	250	Volts
Screen Voltage	...	135	...	Volts
Grid-Number 1 Voltage	0¶	...	...	Volts
Cathode-Bias Resistor	...	100	390	Ohms
Amplification Factor	...	...	53	
Plate Resistance, approximate	...	190000	12000	Ohms
Transconductance	...	8000	4400	Micromhos
Plate Current	33	11.5	7.3	Milliamperes
Screen Current	...	3.2	...	Milliamperes
Grid-Number 1 Voltage, approximate				
Ib = 10 Microamperes	...	...	−10	Volts
Ib = 50 Microamperes	...	−6	...	Volts
Triode Amplification Factor§	...	40	...	

* The time required for the voltage across the heater to reach 80 percent of its rated value after applying 4 times rated heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the rated heater voltage divided by the rated heater current.

† Without external shield.

‡ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations," Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

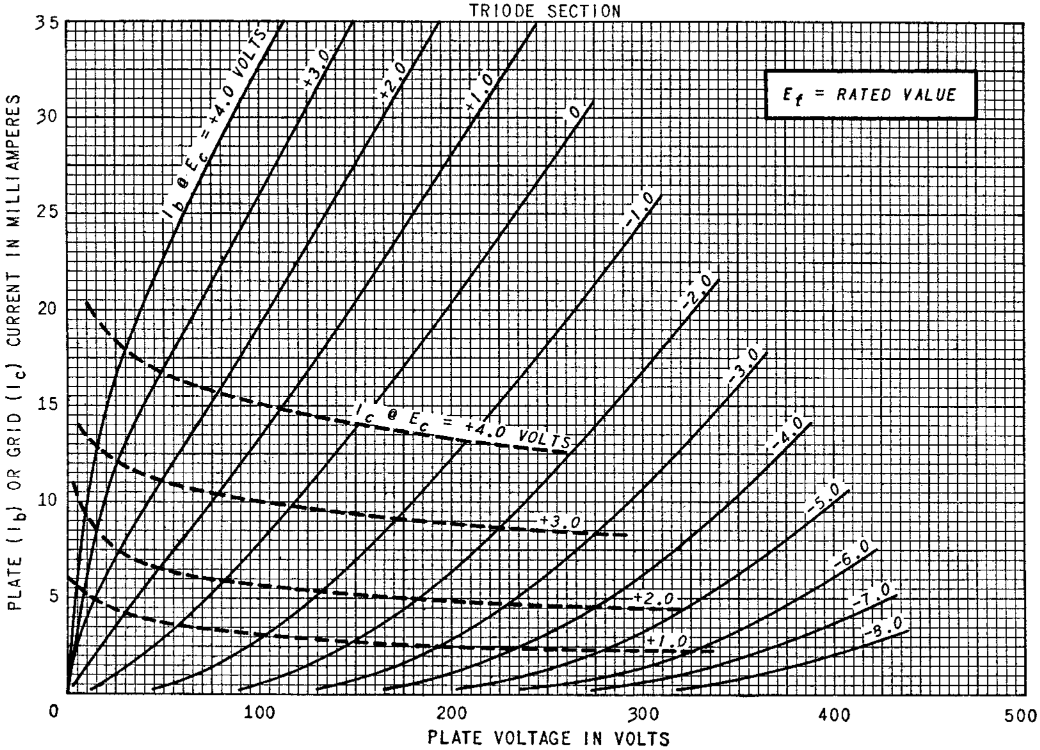
§ With screen connected to plate.

♦ In stages operating with grid-leak bias, an adequate cathode-bias resistor or other suitable means is required to protect the tube in the absence of excitation.

¶ Applied for short interval (two seconds maximum) so as not to damage tube.

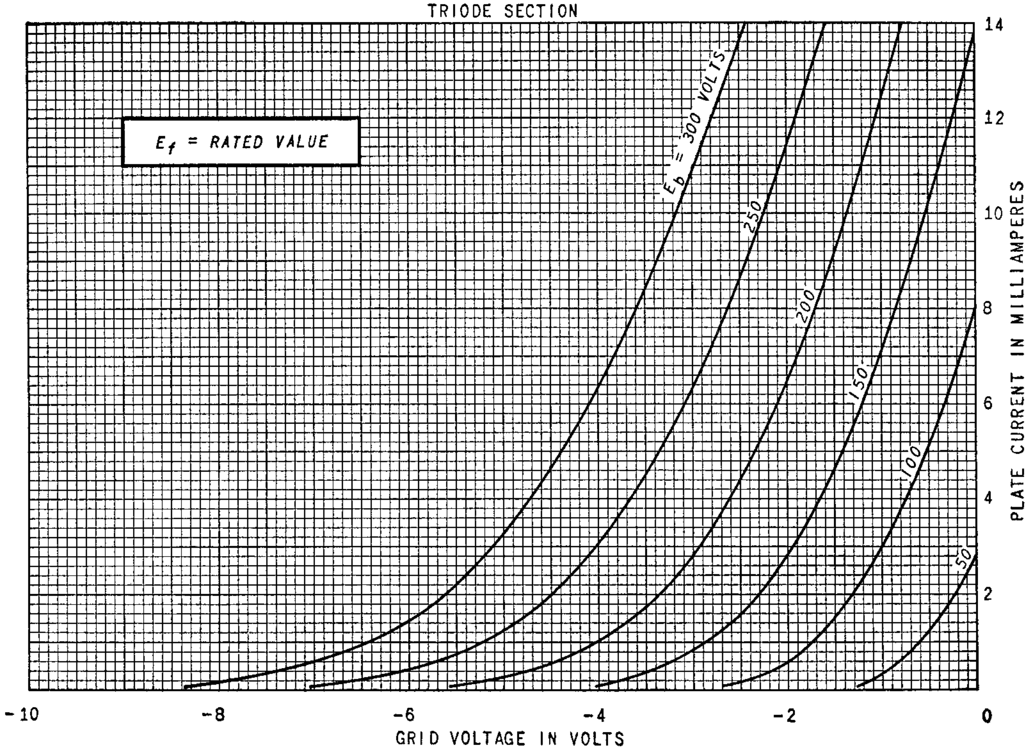
AVERAGE PLATE CHARACTERISTICS

TRIODE SECTION



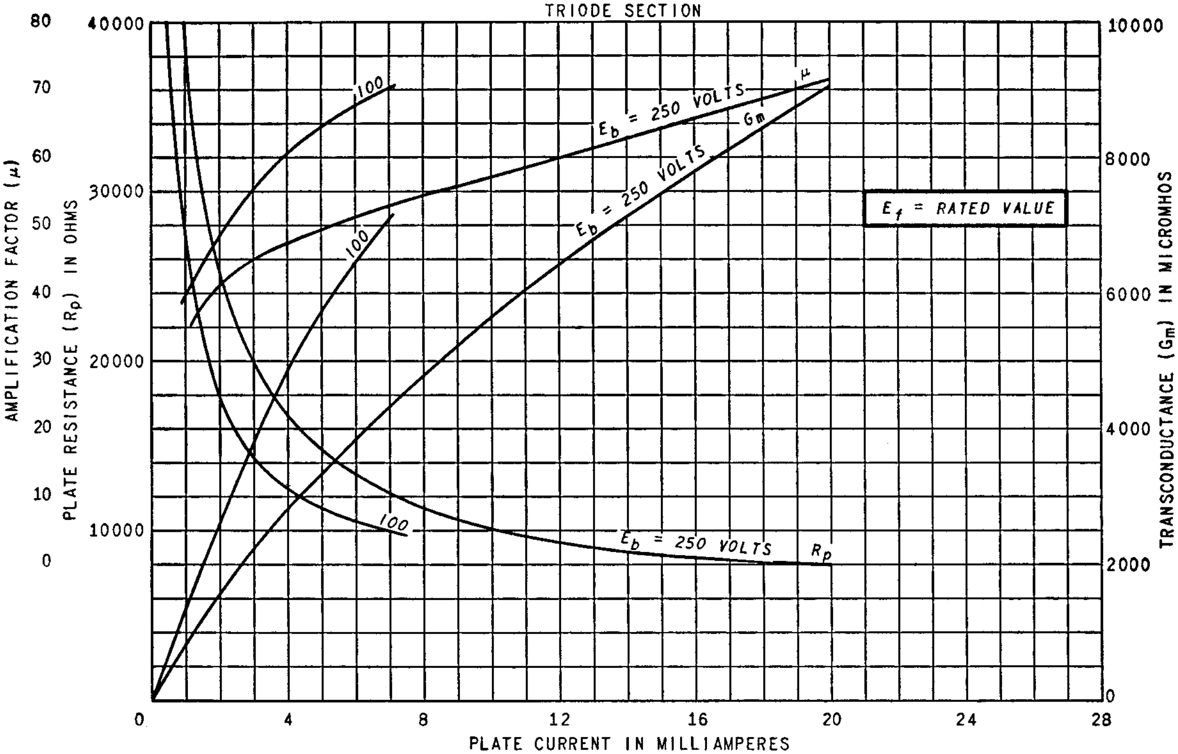
AVERAGE TRANSFER CHARACTERISTICS

TRIODE SECTION

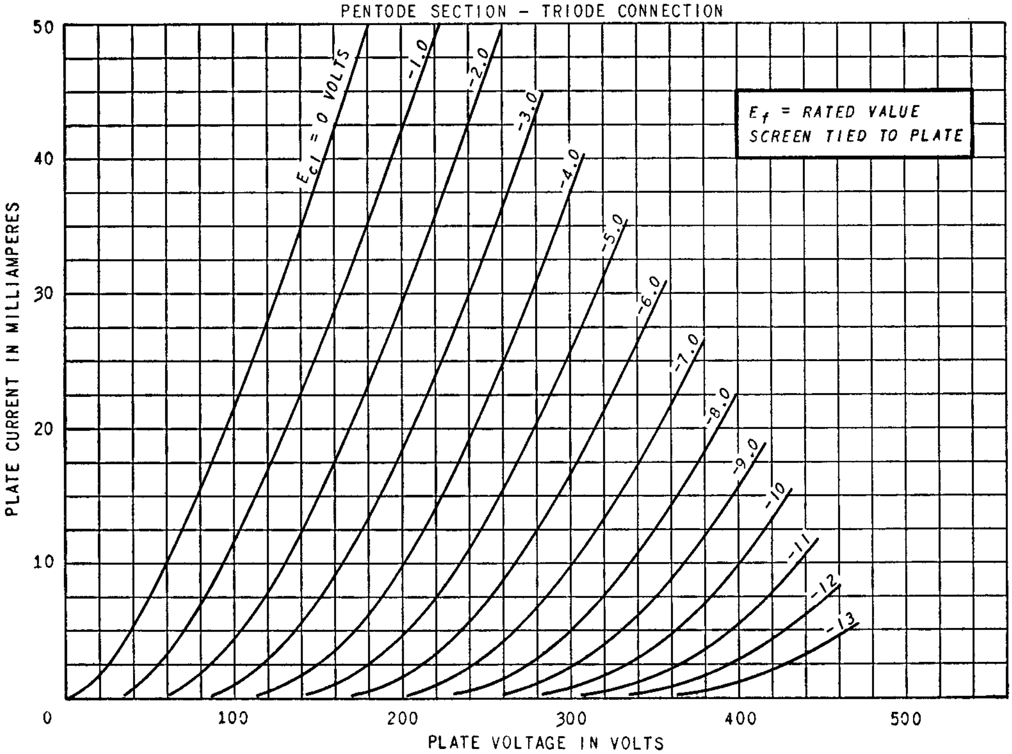


AVERAGE CHARACTERISTICS

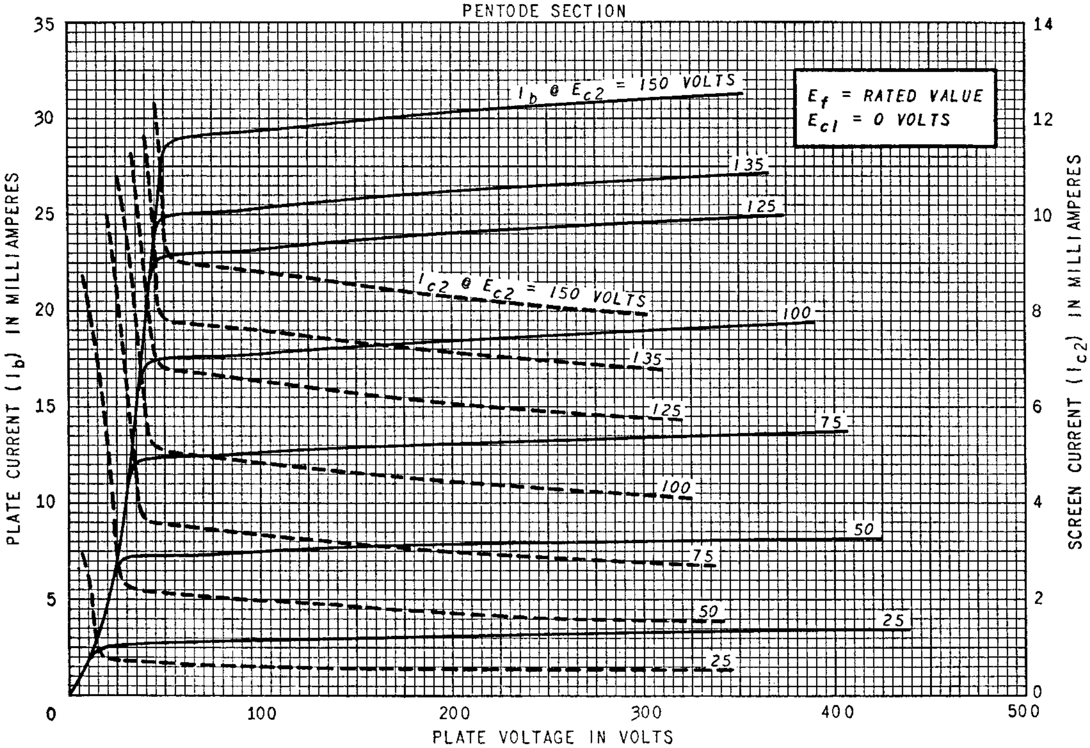
TRIODE SECTION



AVERAGE PLATE CHARACTERISTICS
PENTODE SECTION – TRIODE CONNECTION

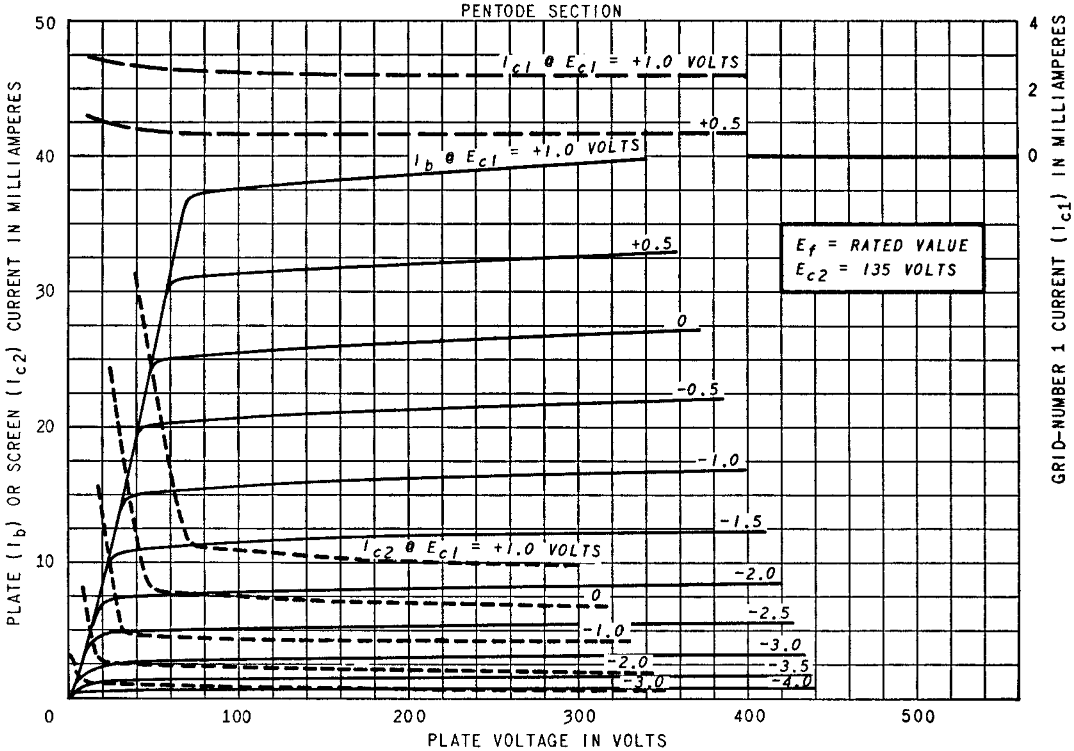


AVERAGE PLATE CHARACTERISTICS
PENTODE SECTION



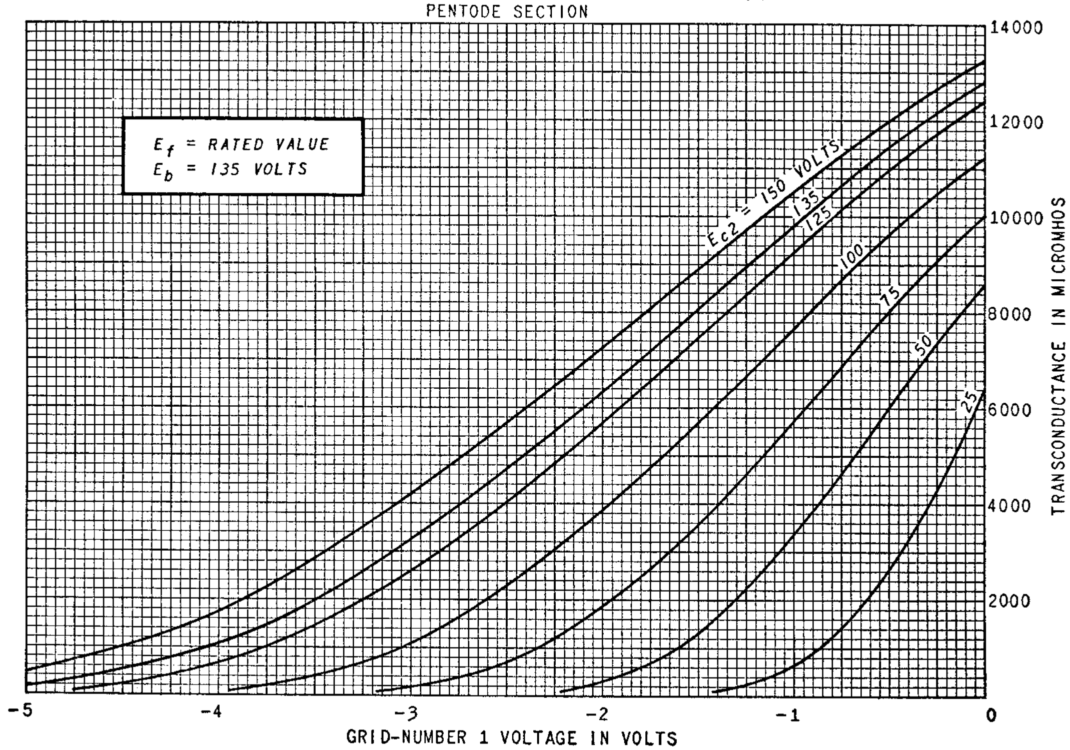
AVERAGE PLATE CHARACTERISTICS

PENTODE SECTION



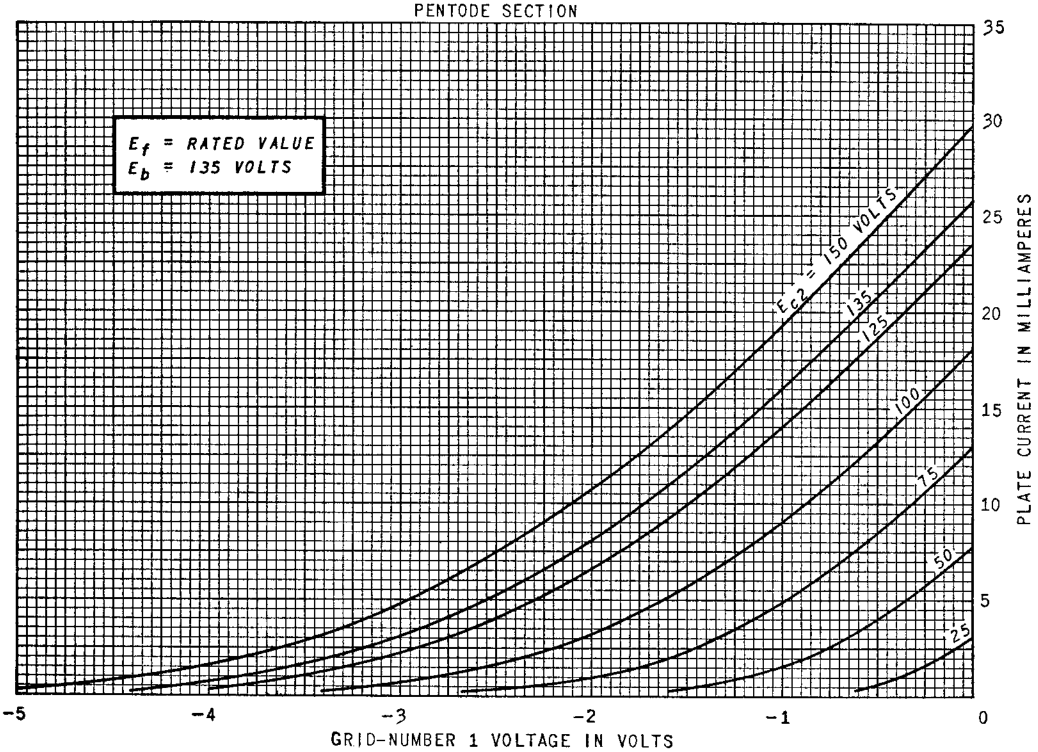
AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION



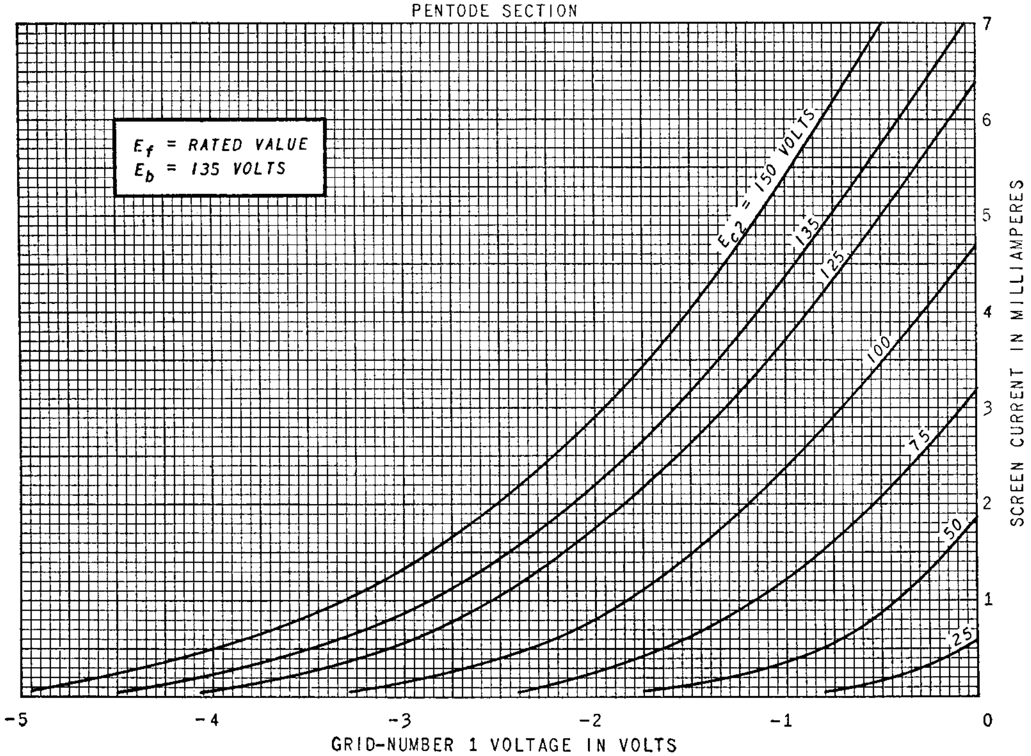
AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION

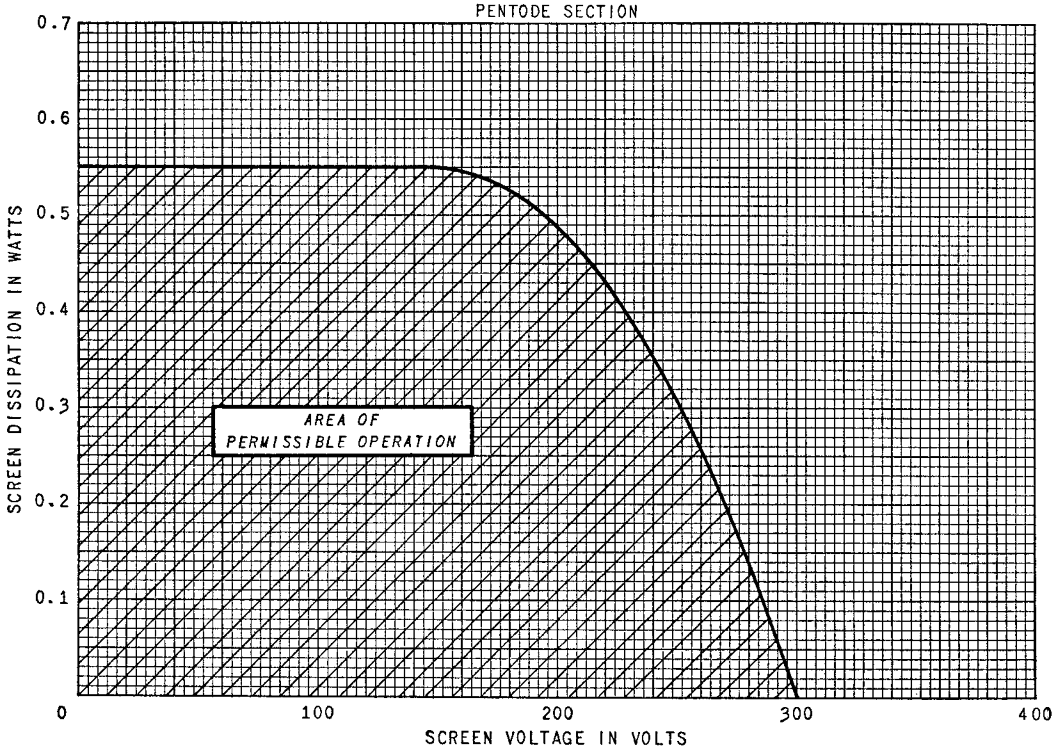


AVERAGE TRANSFER CHARACTERISTICS

PENTODE SECTION



SCREEN RATING CHART



TUBE DEPARTMENT
GENERAL ELECTRIC
Schenectady 5, N. Y.

PRINTED IN U.S.A.